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The Perceived Role of Artificial Intelligence (AI) in Library and Information Science in Tertiary Educational Institutions of Kwara State, Nigeria

By

Suebat A. Busari[1], Gideon A. Babalola[2], Adamu B. Mohammed[3] & Ibrahim O. Yusuf[4]

[1]Department of Library and Information Science, Faculty of Social Sciences, University of Abuja Nigeria
[2]Department of Library and Information Science, Federal University of Technology, Minna
[3]Department of Library and Information Science, School of Management Studies Kogi State Polytechnic.
[4]Department of Library and Information Science, School of Information and Communication Technology, Kwara State College of Arabic and Islamic Legal Studies, Ilorin.
Corresponding Author: busari.ajoke@uniabuja.edu.ng 08056681296

Abstract

The integration of artificial intelligence (AI) into library operations has become increasingly important, yet its perceived role in academic libraries in Kwara State, Nigeria, remains underexplored. This study examined the perceived role of AI in cataloguing, its influence on book indexing, and its contribution to abstracting processes in tertiary educational institutions. A descriptive survey research design was adopted. The population comprised library staff and library students from eight public tertiary institutions (excluding the monotechnic), from which 200 respondents (25 staff and 175 students) were selected using purposive sampling technique. Data were collected through a structured questionnaire whose validity and reliability were established prior to administration. Descriptive statistics (frequency counts and percentages) were used to address the research objectives, while the chi-square test was employed to test the corresponding hypotheses at the 0.05 level of significance. The findings revealed that a majority of respondents perceived AI as enhancing cataloguing efficiency, improving indexing accuracy, and facilitating abstracting processes. Inferential analysis indicated statistically significant relationships between AI utilization and cataloguing ($\chi^2 = 12.96$, $p < .05$), indexing ($\chi^2 = 19.36$, $p < .05$), and abstracting ($\chi^2 = 10.24$, $p < .05$). The study concludes that AI has a significant positive influence on library functions and recommends increased funding and strategic adoption of AI technologies in academic libraries.

***Keywords*:** artificial intelligence, library and information science, academic libraries, tertiary institutions, kwara state

Introduction

Artificial intelligence (AI) refers to machines' ability to perform tasks traditionally requiring human intelligence, such as learning, problem-solving, and decision-making (Johnson, 2018). AI encompasses subfields including reasoning, knowledge representation, planning, learning, natural language processing, perception, and robotics (Russell & Norvig,

2021). To achieve these capabilities, AI systems utilize methods such as search and optimization, artificial neural networks, formal logic, and probabilistic reasoning. AI also draws upon diverse disciplines including psychology, linguistics, philosophy, and neuroscience.

Library and Information Science (LIS) is a dynamic discipline that increasingly relies on evolving technologies. The automation of library processes, particularly through e-library systems, has transformed knowledge creation, access, and dissemination (Busari & Idris, 2025). Traditional library services are under pressure to adapt to emerging technologies like AI. Consequently, LIS curricula need to integrate AI to equip professionals for efficient, globally competitive library services.

Within LIS, AI is progressively applied in core library operations such as indexing and abstracting. AI can automatically identify key terms, classify topics, and generate structured indexes from large volumes of text, enhancing speed and accuracy compared to manual methods (Asemi & Asemi, 2018). Similarly, AI-driven summarization tools can extract essential information from documents to produce concise abstracts, reducing time, effort, and errors associated with manual processes (Suberveerapandiyan, 2023). By supporting these functions, AI improves operational efficiency while enabling librarians to focus on higher-level tasks requiring professional judgment.

Although AI adoption in libraries is growing globally, there is limited empirical evidence on its perceived role in academic libraries in Kwara State, Nigeria. Understanding AI's contribution to cataloguing, indexing, and abstracting is essential for enhancing library efficiency, accuracy, and service quality. This study addresses this gap by examining AI's perceived role in academic library operations, providing evidence to inform policy, strategic planning, and integration of AI into LIS curricula.

Research Objectives

1. To examine the role of artificial intelligence in cataloguing books in library and information science in tertiary educational institutions of Kwara State, Nigeria.
2. To examine the role of artificial intelligence in book indexing in library and information science in tertiary educational institutions of Kwara State, Nigeria.
3. To examine the role of artificial intelligence in enhancing abstracting

processes in library and information science in tertiary educational institutions of Kwara State, Nigeria.

Research Hypotheses

The following hypotheses are formulated to guide the study:

Ho_1: There is no significant role of artificial intelligence in cataloguing books in library and information science in tertiary educational institutions of Kwara State, Nigeria.

Ho_2: There is no significant role of artificial intelligence in book indexing in library and information science in tertiary educational institutions of Kwara State, Nigeria.

Ho_3: There is no significant role of artificial intelligence in abstracting processes in library and information science in tertiary educational institutions of Kwara State, Nigeria.

Literature Review

Artificial Intelligence Application in Library and Information Science

Artificial intelligence (AI) emerged as an academic discipline in 1956 and has evolved through cycles of optimism, reduced funding, and renewed advancement. A major turning point occurred after 2012, when deep learning techniques significantly outperformed earlier AI models, leading to increased global investment and research expansion (Russell & Norvig, 2021). AI encompasses core capabilities such as reasoning, problem-solving, knowledge representation, planning, decision-making, learning, natural language processing, perception, robotics, and the pursuit of general intelligence (Williams, 2019). To achieve these capabilities, AI systems employ tools including search and optimization algorithms, probabilistic reasoning, classifiers, statistical learning models, artificial neural networks, and deep learning architectures (Jordan & Mitchell, 2018).

In higher education, AI adoption continues to grow. Malik et al. (2025) proposed a context-sensitive roadmap for ethical and inclusive AI implementation in Nigerian universities, highlighting the importance of policy development, culturally responsive faculty training, infrastructure enhancement, curriculum integration, and governance mechanisms. Their study emphasizes that AI integration must be accompanied by ethical oversight and institutional preparedness.

Within Library and Information Science (LIS), AI is increasingly recognized as a transformative technology. Academic libraries are central to teaching, learning, and research in tertiary institutions, and digitization has shifted traditional manual methods toward automated systems (Asemi & Asemi, 2018). AI-driven tools, including recommender systems, intelligent search engines, chatbots, robotic retrieval systems, and automated metadata generators, are redefining service delivery in libraries (Massis, 2018; Shelton, 2019).

However, adoption challenges remain, especially in developing countries. The World Bank (2016) and International Labour Organization (2018) noted that AI could lead to job displacement, particularly in developing economies. In Nigeria, limited funding, inadequate infrastructure, unreliable power supply, and scarcity of technical expertise hinder the uptake of AI in academic libraries (Tella, 2020). These contextual realities highlight the need to examine AI's perceived role specifically in Nigerian tertiary institutions.

AI in Cataloguing, Indexing, and Abstracting

AI has made significant inroads in the three core technical services of libraries: cataloguing, indexing, and abstracting. Cataloguing traditionally requires extensive manual effort and professional expertise to classify, organize, and assign subject headings to materials. AI systems can now automate metadata generation, assign subject classifications, and identify descriptors, improving speed, consistency, and accuracy (Asemi & Asemi, 2018). Talley (2016) discussed the integration of intelligent agents in academic law libraries, emphasizing that AI reduces staff workload in classification and metadata tagging. Johnson (2018) further noted that predictive algorithms enable AI to learn from existing cataloguing data, streamlining the organization of new materials. AI-driven cataloguing tools utilize natural language processing and machine learning to analyze bibliographic data and full-text documents, ensuring uniform classification standards and minimizing duplication errors. Arlitsch and Newell (2017) highlighted that automation in cataloguing represents a structural transformation in information curation rather than a mere technological shift.

Indexing, which involves identifying key concepts and creating structured entries for efficient retrieval, is similarly enhanced by AI. Natural language processing and text-

mining algorithms enable AI to extract keywords, identify recurring themes, and generate index entries quickly. Oyelude (2017) highlighted the growing use of AI for keyword extraction and semantic indexing in libraries, while Suberveerapandiyan (2025) observed that natural language processing applications essential for indexing remain underdeveloped in many institutions. Williams (2019) emphasized that users increasingly expect databases to understand queries in natural language, driving the adoption of intelligent indexing systems. By automating indexing, AI improves retrieval accuracy, reduces processing time, and enhances user experience.

Abstracting, the process of summarizing core document content into concise representations, is cognitively demanding and time-consuming. AI-driven summarization systems leverage machine learning and deep learning models to generate automated abstracts, significantly reducing manual workload (Suberveerapandiyan, 2025). Miao (2019) highlighted the ethical need for responsible AI use in knowledge production, including automated summarization. Shelton (2019) noted that AI chatbots and automated systems can provide rapid summaries to library users, while Massis (2018) emphasized that professional oversight remains essential to maintain accuracy and credibility. AI-assisted abstracting reduces cognitive load, improves consistency, and enables librarians to focus on analytical and research-support functions.

Collectively, these studies indicate that AI is perceived as a valuable tool in enhancing efficiency, accuracy, and service delivery across cataloguing, indexing, and abstracting in academic libraries. These insights directly support the study's objectives to examine AI's role in these core functions within tertiary institutions in Kwara State, Nigeria.

Methodology

This study adopted a descriptive survey research design to examine respondents' perceptions of the role of Artificial Intelligence (AI) in cataloguing, indexing, and abstracting within Library and Information Science (LIS) in public tertiary institutions in Kwara State, Nigeria. Monotechnics such as Colleges of Nursing, Agriculture, and Labour Studies were excluded from the study. The population comprised library staff and students from universities, polytechnics, and colleges of education offering Degree, NCE, and Diploma programmes across the three

senatorial districts of Kwara State (Central, North, and South). A purposive sampling technique was employed to select 25 library staff and 175 LIS students, yielding a total sample size of 200 respondents. Greater emphasis was placed on students majoring in LIS due to their direct engagement with cataloguing, indexing, and abstracting processes.

Data were collected using a structured Likert-scale questionnaire titled "*Perceived Role of Artificial Intelligence in Cataloguing, Indexing, and Abstracting Questionnaire*." The instrument was validated by experts in Library and Information Science and Measurement and Evaluation to ensure content validity. Reliability was established through the test–retest method, yielding a Pearson Product Moment Correlation coefficient of 0.85, indicating high reliability.

The researchers personally administered the instrument to ensure a high response rate. Descriptive statistics (frequency counts and percentages) were used to address the research objectives by summarizing respondents' views. For hypothesis testing, responses were categorized into agree and disagree groups, and the Chi-square (X^2) statistical technique was employed to test for significant relationships at the 0.05 level of significance. The Chi-square test was considered appropriate because the data were analyzed in categorical form and the study sought to determine associations between variables rather than measure linear correlation.

Results Presentation

Descriptive statistics were computed using frequency counts and percentages to examine respondents' perceptions of the role of artificial intelligence (AI) in cataloguing, indexing, and abstracting in tertiary institutions in Kwara State, Nigeria.

Objective One: The role of artificial intelligence in cataloguing books in library and information science in tertiary educational institutions of Kwara State, Nigeria

The analysis revealed that 136 respondents (68%) agreed that artificial intelligence positively influences the cataloguing of library materials, while 64 respondents (32%) disagreed. This indicates that a majority of respondents perceive artificial intelligence as enhancing efficiency and accuracy in cataloguing processes.

Objective Two: The role of artificial intelligence in book indexing in library and

information science in tertiary educational institutions of Kwara State, Nigeria

Findings showed that 144 respondents (72%) agreed that artificial intelligence improves book indexing, whereas 56 respondents (28%) disagreed. This suggests a strong positive perception of artificial intelligence in enhancing indexing processes in libraries.

Objective Three: The role of artificial intelligence in enhancing abstracting processes in library and information science in tertiary educational institutions of Kwara State, Nigeria

The results indicated that 132 respondents (66%) agreed that artificial intelligence enhances abstracting processes, while 68 respondents (34%) disagreed. This reflects a generally positive perception of artificial intelligence in improving abstracting efficiency and effectiveness.

7. Testing of the Hypotheses

Ho_1: There is no significant role of artificial intelligence in cataloguing books in the library.

Table1: Chi-square statistical analysis of respondents' opinions concerning the role of AI in cataloguing library books.

Statement	Agree	Disagree	Total	Calcul X_2	Critical X_2	df	level of sig.
Use of AI has impact on cataloguing of library books	**Observed** 136 **Expected** (100)	**Observed** 64 **Expected** (100)	200	12.96	3.84	1	0.05

The result in Table 1 shows that the calculated chi-square value is greater than the critical value (since 12.96 > 3.84) at 1 degree of freedom and 0.05 level of significance. Hence the Null Hypothesis One (Ho_1) is rejected.

Ho_2: There is no significant role of artificial intelligence in book indexing in the library.

Table2: Chi-square statistical analysis of respondents' opinions concerning the role of AI in indexing library books

Statement	Agree	Disagree	Total	Calcul X_2	Critical X_2	df	level of sig.
Application of AI enhances indexing of library books	**Observed** 144 **Expected** (100)	**Observed** 56 **Expected** (100)	200	19.36	3.84	1	0.05

The result in table 2 indicates that the calculated chi-square value is greater than the critical value (since 19.36 > 3.84) at 1 degree of freedom and 0.05 level of significance; hence the Null Hypothesis Two (Ho_1) is rejected.

Ho_3: There is no significant role of artificial intelligence in abstracting in the library.

Table3: : Chi-square statistical analysis of respondents' opinions concerning the role of AI in abstracting.

Statement	Agree	Disagree	Total	Calcul X_2	Critical X_2	df	level of sig.
Utilization of AI has positive impact on abstracting in the library	**Observed** 132 **Expected** (100)	**Observed** 68 **Expected** (100)	200	10.24	3.84	1	0.05

The result in table 3 reveals that the calculated chi-square value is greater than the critical value (since 10.24> 3.84) at 1 degree of freedom and 0.05 level of significance; hence the Null Hypothesis Three (Ho_3) is rejected

Discussions of Findings

Objective One: The role of artificial intelligence in cataloguing books in library and information science in tertiary educational institutions of Kwara State, Nigeria

The findings of this study revealed that artificial intelligence plays a significant role in enhancing cataloguing processes in academic libraries. The majority of respondents agreed that AI improves the organization and classification of library materials by increasing efficiency and reducing errors. This suggests that tasks that traditionally required extensive manual effort can now be performed more quickly and accurately, allowing library staff to focus on other essential responsibilities.

This finding corroborates the work of Asemi and Asemi (2018), who reported that AI technologies enhance precision and minimize human error in cataloguing operations. It also aligns with Russell and Norvig (2021), who emphasized that AI systems improve task automation and operational efficiency across various domains, including information management. Therefore, the integration of AI into cataloguing functions represents a significant advancement in modern library practices.

Objective Two: The role of artificial intelligence in book indexing in library and information science in tertiary educational institutions of Kwara State, Nigeria

The study further established that artificial intelligence significantly enhances indexing processes in libraries. Respondents indicated that AI makes indexing faster, more systematic, and less labor-intensive compared to traditional manual methods. The improved ability of AI systems to organize and structure information contributes to better accessibility and retrieval of library resources.

This finding is consistent with Suberveerapandiyan (2023), who noted that AI-based indexing tools reduce human effort while improving consistency and quality in indexing practices. The results also support broader observations in the literature that AI facilitates efficient information organization, thereby enhancing user access to library materials. Consequently, AI adoption in indexing is essential for improving service delivery in academic libraries.

Objective Three: The role of artificial intelligence in enhancing abstracting processes in library and information science in tertiary educational institutions of Kwara State, Nigeria

The findings also indicated that artificial intelligence plays a crucial role in improving abstracting processes. Respondents perceived that AI significantly reduces the time required for abstract preparation while

maintaining high levels of accuracy and consistency. Tasks that previously required considerable cognitive effort and time can now be completed within a much shorter period using AI-powered tools.

This supports the findings of Asemi and Asemi (2018), who highlighted the efficiency gains associated with AI in information processing tasks. Similarly, Russell and Norvig (2021) emphasized the capability of AI systems to handle complex cognitive tasks with speed and reliability. The implication is that AI not only enhances productivity but also ensures the quality of abstracts, which are essential for research and knowledge dissemination.

Conclusion

The study revealed that respondents perceive artificial intelligence (AI) as having a significant role in library operations in tertiary educational institutions of Kwara State, Nigeria. Participants reported that AI enhances the efficiency and accuracy of cataloguing, supports faster and more reliable indexing of library materials, and facilitates the abstracting process, making it less time-consuming and cognitively demanding. Respondents also indicated that AI improves service delivery by helping users access information more effectively while minimizing errors commonly associated with manual processes. Overall, the findings demonstrate that AI is perceived as a valuable tool for supporting library staff productivity, modernizing library operations, and enhancing user satisfaction in academic libraries.

Recommendations

Based on respondents' perceptions of AI effectiveness in academic libraries of Kwara State, Nigeria, the following recommendations are proposed:

Objective One: The role of artificial intelligence in cataloguing books in library and information science in tertiary educational institutions of Kwara State, Nigeria

Libraries should fully implement AI-based cataloguing systems by selecting library management software with integrated AI modules capable of automating classification and metadata enrichment. Current cataloguing workflows should be mapped to identify processes that can be automated, such as subject classification, call number assignment, and metadata tagging. Library staff should receive structured training and practical workshops on using AI tools to

catalog new materials and update records efficiently. This approach will enhance accuracy, speed, and consistency in cataloguing, while allowing staff to focus on higher-level responsibilities and strategic library operations.

Objective Two: The role of artificial intelligence in book indexing in library and information science in tertiary educational institutions of Kwara State, Nigeria

Libraries should adopt AI-driven indexing systems that incorporate natural language processing (NLP) capabilities for automated keyword extraction, semantic tagging, and subject heading suggestions. A quality-control workflow should be established where staff review AI-generated indexes for relevance and consistency before final approval. Continuous professional development programs should be provided to ensure indexing staff are proficient in system features, troubleshooting, and updates. Implementing these measures will result in faster, standardized, and reliable indexing, improving the discoverability and accessibility of library resources for users.

Objective Three: The role of artificial intelligence in enhancing abstracting processes in library and information science in tertiary educational institutions of Kwara State, Nigeria

Libraries should integrate AI-powered abstracting tools capable of summarizing text, identifying key concepts, and generating draft abstracts from books, journals, and theses. Staff should supervise and edit AI-generated abstracts to ensure accuracy, relevance, and consistency. Regular monitoring of system performance and adjustments to AI parameters based on staff feedback will help optimize output quality over time. These actions will significantly reduce the time and cognitive effort required for abstracting, while ensuring high-quality abstracts that support research and learning effectively.

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